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Coordination of Industrial Hygiene with the General Health Field

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AS the title implies, the chief purpose of this paper is to present a few practical suggestions relative to teamwork in carrying out a program for the promotion and protection of the health and safety of our industrial population. Naturally this involves a close and cooperative working relationship between official industrial hygiene units and various groups in the general health field.

Until very recently, health services to adults, and especially industrial workers, have been seriously neglected. In the past, our efforts have been concentrated on the mother, the infant, the preschool and school child. We have now come to realize that the health of adults, and especially those gainfully employed, must come in for just and meritorious consideration. In fact, the whole emphasis of our endeavour must be shifted to this group if we are to be guided by the exigency of the problem with which we are today confronted, as evidenced by our morbidity and mortality records. Reference to these statistics shows that heart disease, cerebral hemorrhage, cancer, kidney disease, syphilis, tuberculosis, pneumonia, diabetes, occupational diseases and accidents are the great disablers and killers at the present time. Most common infectious diseases, such as smallpox, diphtheria and typhoid fever, are now well under control, and diseases of infancy and maternity are showing a healthy downward trend; not so, however, with the previously mentioned group, except to some extent with tuberculosis

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and pneumonia, and just very recently with pneumonia; in fact, only since the advent of the sulpha drugs and penicillin. Several diseases of this group are even showing a upward trend, especially cancer, heart and circulatory diseases. Each of the group is taking a greater toll than all of the common infectious diseases combined.

When we consider that it is among our adult population, and especially industrial workers, that these afflictions are taking their greatest toll, and that all of these conditions can be controlled within certain limits, we immediately sense the vital importance of bringing our combined efforts to the aid of this group. Industrial health service, as we now conceive it, constitutes the sound, proper and logical approach to the gradual but progressive solution of these problems.

While the legal responsibility for protecting the health of industrial workers is primarily a function of official public health agencies, the medical and nursing professions, industry, and labor, all have a definite moral responsibility, and naturally their cooperation is essential in accomplishing the desired goal.

The physician in the private practice of medicine, whether he has part-time affiliations with industry or not, is concerned primarily with healing the sick and injured and is practising the curative aspects of industrial medicine, since he treats most industrial as well as non-industrial illnesses and accidents. True, a few of the larger industrial plants have full-time medical and nursing staffs, some of which provide medical care for conditions arising out of employment. A much larger number of moderate-sized plants have nursing service with or without part-time medical direction, and the vast majority of plants have no medical department. The principal duties of a plant medical department, whether staffed by full-time or part-time physicians, are:

1. To conserve the health of workers.
2. To prevent specific diseases or injuries in industry, and
3. To promote rapid return of the injured worker to health and productivity.

For the latter, we look to the practising physician. The full-time plant physician, like the public health officer, does not treat the patient, except of course in emergencies, but does see to it that he gets prompt, effective therapy in order to get him back on the job at the earliest moment compatible with sound health practice.

The plant doctor, or in his absence, the nurse, refers the sick or injured worker to a physician. In so doing he gives the physician helpful information regarding the individual and his work environment. The plant physician also follows through to see that the worker avails himself of and gets the medical care needed to restore him to health and the job.

If the patient tells his physician, "Doc, the fumes down at the plant are getting me," the latter should be curious enough to know what fumes the patient refers to. Too often the doctor agrees, and makes out a claim for compensation for an occupational disease in which he states patient's illness is due to fumes, dust, gas or whatnot, without giving the slightest thought to what those fumes or vapors might be or what symptoms specific air contaminants might be expected to produce if present in excessive concentrations. As a result we not infrequently

see physicians' reports of occupational diseases wherein carbon tetrachloride is reported to have caused pneumonia and wood smoke to have caused kidney damage. How much better it would be if the doctor would take a few minutes to call the plant medical department or, if none, management, to find out possible exposures. If a number of patients from a given plant present like symptoms, a visit to the plant by the doctor to see the process himself should be most interesting and educational.

Certainly management and labor would appreciate this attention and interest. Such a visit *could* lead to misinterpretation of facts. For example, the boss might say the worker is exposed to lead, or the physician himself may note that lead is used. If the patient has symptoms suggestive of lead poisoning, the physician might be guilty of the very common error of jumping to conclusions. A diagnosis of occupational disease should never be made on either history, clinical or laboratory findings alone. It may not be lead poisoning even though a man works where there is lead, and has a bellyache and a stippled blood cell or two. On the other hand, the absence of stippled cells may not be sufficient to rule out lead poisoning. The amount of lead a worker is exposed to, as well as the amount of lead in his urine, can be determined by the industrial hygiene personnel of the health department. Another common and often extremely unfortunate situation arises when the physician unwisely advises a skilled worker with years of experience to discontinue work at his trade.

Again, it should be obvious that unless the physician, be he in industry or in private practice, promptly reports to the proper authorities the occurrence of occupational diseases among workers, it will be next to impossible for the official agency responsible for the control of such diseases to carry out its functions. Physicians should adopt toward the reporting of occupational diseases the same attitude which now exists with regard to the reporting of communicable diseases. The recurrence of such diseases may be obviated by prompt investigation, and instigation of control measures on the part of the State or Provincial industrial hygiene unit, of those conditions in the plant which may be the causative agent.

Another obligation of the physician has to do with advising the individual patient regarding his health. He should enlist the patient's cooperation in the prevention and control of diseases arising out of his occupation and in the promotion of general health and mental well-being.

The medical profession can make still another important contribution in the field of industrial health by stimulating the pre-placement and periodic physical examination of workers in industry, assisting in the proper placement of workers, compatible with their physical and mental health, and by calling attention to the necessity for correcting those physical defects revealed by a health examination.

Finally, it is to be stressed that the private practitioner should utilize to the fullest extent the services which may be rendered by the official industrial hygiene unit, and through it, the facilities available in the entire health department.

For those physicians in industry who are completely responsible for furnishing an industrial health program, the Council on Industrial Health of the American Medical Association has suggested a definite program. This program

consists of such functions as periodic inspection and appraisal of plant sanitation and occupational exposures, followed by the adoption and maintenance of adequate control measures; the provision of first-aid and emergency services and the prompt and early treatment for all illnesses resulting from occupational exposures; impartial health appraisals of all workers; the provision of rehabilitation services for the correction of defects; the conduct of a health promotion program and, finally, recording and reducing absenteeism due to all types of disability. By carrying out such a service, it should be possible to make real progress in reducing lost time among workers, thereby benefiting not only the worker as regards his physical health, but also yielding tangible benefits of a monetary nature to both the employer and the employee. The plant physician must also concern himself with the impact of community health on that of his workers and hence cooperate and work in close harmony with his health department. It is now generally conceded that if we are to advance in the development of physical and mental well-being among workers, we must pay attention not only to the working environment, but also to factors associated with conditions outside the work place.

There is a growing recognition by industry, labor, and the medical profession, of the importance of the role of the industrial nurse. Unfortunately, too few industrial nurses have the proper conception of the opportunities and possibilities of their job; hence, the indication for additional training in our universities, and for more adequate guidance and counsel from the physician and the consultant industrial hygiene nurse of the health department.

Colleges and universities throughout the United States, and most likely in other areas, have been setting up courses of study designed to broaden the experience and scope of industrial nurses.

The University of Washington has been among the leaders in developing training for industrial nurses, and now gives a Bachelor of Science degree in nursing, with a major in industrial nursing. The details of this University program are presented in a paper recently read by Gladys A. Jahncke of our staff at the 1948 meeting of the American Association of Industrial Nurses, which no doubt will be published in the near future.

Since industrial nurses far outnumber industrial physicians, much of the responsibility for industrial health services falls directly on their shoulders. Many nurses are employed in industry without medical supervision. These nurses are often called on by management to carry out certain medical procedures. The ethics and standards of both the medical and nursing professions require medical direction for nursing services. The industrial nurses need and want standing orders to guide them in their work. The Council on Industrial Health of the American Medical Association recognizes this need and has set up detailed guides to assist the physician in preparing such orders. The full-time and part-time plant physician should provide standing orders. In plants with nursing services but without medical direction, the profession should, through the industrial hygiene committee of the local medical society, provide such orders.

The industrial nurse contributes to the efficiency of the worker by being alert to the factors which cause illness and fatigue and which reduce producti-

vity. Through skilled first-aid and nursing care, through teaching healthful ways of living at the moment when they are important to the individual, and through utilization of community health and welfare services to meet the needs of the worker and his family, she not only protects their health and safety, but also promotes good working relations in the plant.

Thus we see developing a picture of teamwork between the industrial plant, the physician, the nurse and the health department, in the interest of protecting the health of the worker and his family. Now let us see how this teamwork operates among the workers of state and local health departments. The industrial hygiene unit in the State and Provincial health department has doctors, engineers, nurses and chemists trained in the recognition and control of occupational diseases. They work as a team, each contributing his bit to the prevention and control of occupational diseases. If we stopped here, industrial hygiene would be quite worthwhile. However, when we consider that 90 per cent of lost time from work as a result of disability is due to non-occupational diseases and injuries—the things that happen to you or me, regardless of where we work or if we work—we immediately sense that all services of the state and local health departments are needed for the worker and his family. In the past, and pretty much so today, the mother, the preschool and school age groups have constituted the chief approach for public health to the family. But through the development of industrial hygiene service, with its rapport with industry and labor, we have a direct approach to our working population. As a result the industrial plant and the union hall have been opened to the specialists in tuberculosis, venereal disease and cancer control, to the vital statistician, nutritionist, mental hygienist, sanitarian and dentist.

The prevention of occupational diseases and accidents is closely related. In spite of this, programs relating to them have been quite widely separated, since accident prevention is carried out primarily by the labor departments, and industrial hygiene has usually been established in health departments. This has resulted in a certain amount of overlapping in the programs of these two departments, aggravated by the laws under which each operates. These laws often give both departments general responsibility for protecting the health and safety of the working population. Legislative bodies have seldom attempted to clarify the specific responsibilities of each sufficiently to prevent duplication, over-lapping and misunderstanding.

Thus, it has been necessary for those departments charged with industrial insurance and accident prevention and those charged with health preservation to correlate their activities. In the authors' combined experience in several states, such correlation has been very poor. To overcome this difficulty these two departments of government in the State of Washington decided to attack their mutual problems in an intelligent manner through teamwork. As a result an agreement[1] has been set up to effect a more efficient integration and coordination of services for the protection of the health and safety of industrial workers in the

[1]"Coordination of Official Hygiene Program with Other Agencies," Lloyd M. Farner, M.D., Head, Industrial and Adult Hygiene Section, Washington State Department of Health. Industrial Medicine, 1946, *15*, 381-383.

State of Washington This agreement has been in operation two and one-half years now and we believe represents forward thinking since not only is it working most satisfactorily in our State but we note with pleasure that the State of California has recently inaugurated a similar approach.

Teamwork between the industrial hygiene unit and the local health department is of equal importance. Under present practice throughout Canada and the United States, industrial hygiene is carried out primarily as a centralized direct service provided by the Provincial and State health departments.

Local health departments have participated less in the actual conduct of industrial hygiene programs than in almost any other phase of public health of comparable importance. There are several reasons for this. Industrial hygiene according to earlier concept was limited to the prevention of occupational diseases; such work is specialized and requires specially trained personnel and extensive laboratory and field equipment. Local health departments do not as a rule have personnel with such training nor can they usually justify the expenditures necessary for the specialized equipment. Furthermore, the average local health department seldom has sufficient funds in its budget to carry out all of the activities which it would like to do in a generalized health program. Consequently, the local health officer is usually quite willing to rely on the State or Provincial department to take care of his industrial hygiene problems.

From the broader definition of industrial hygiene employed, there is no question but that every local health department has a direct interest and responsibility in this field.

Without attempting to go into any detail, we would say that it is the responsibility of the local health officer to know what industries are located in his community, something about their size, and the general nature of their operations. He is directly concerned with any problems involving sanitation within those plants or the effects which their operations may have upon the sanitary conditions of the community. This would include, of course, problems involving water supply, the disposal of sanitary and industrial wastes, and also atmospheric pollution by gases, smoke, or dust emanting from the plant. He is responsible, without question, for seeing that any food served within the plant, such as in a company-operated cafeteria, meets the same requirements that are set up for other public eating establishments. Of course many of these problems would be the direct responsibility of the local sanitarian. He is in a strategic position also to conduct a preliminary survey of the plant. In so doing, other problems will be found in which the local health department can assist. Still others will necessitate calling in the industrial hygiene personnel of the State or Province with their specialized equipment.

Local sanitarians can assist with these specialized studies and can follow-up to urge and evaluate compliance with recommendations. Industry and labor will more and more turn to him for help with their health problems and leave it up to him to call in the State or Province when necessary.

More important possibly than these direct responsibilities is the necessity for the health officer to realize that the industrial establishment offers him a golden opportunity to promote adult health among a group in the same way that

he now promotes child health in the schools. It is just in the last few years that wide-awake health officers have begun to realize the potentialities of this. State and Provincial industrial hygiene units likewise are beginning to devote more of their time to promoting this idea with local health departments.

The public health nurse is in an ideal position to promote the programs of both the local health department and the industrial hygiene unit. She should become acquainted with the industrial nurses in her community through direct contact on the job and through meeting with them in professional organizations. She should stimulate the industrial nurse's interest in communicable disease and other community health problems so that the latter will report to the local health department any such problems that she comes in contact with. The public health nurse should also acquaint the industrial nurse with all of the community health and welfare services available so that the latter may be able to see that plant employees or members of their family receive benefit of such services when necessary.

From the above discussion it is evident that the local health department could and should do more in the industrial and adult hygiene field. Ways and means of stimulating this accomplishment should be given serious consideration.

In summary, industrial health, one of the vital problems of the day, is one which not only seriously concerns the many millions of persons who compose our industrial population, but very definitely affects the social and economic status of our nations. Furthermore, it is a problem which cannot be confined to the four walls of any business, for industrial health inevitably leads to improved public and community health. The reasons for such a direct relationship become apparent when we realize that industry is part and parcel of every community, and what occurs in the one element of society very definitely affects the other.

It is also evident from our discussion that in order to provide an effective health service for our industrial population, the cooperation and integrated action of many groups is required, since industrial health touches the interests of employer, employee, public health and safety officials, doctor, nurse, educator, engineer, chemist, social worker, insurance representative, and, no doubt, others. Each of these groups has a distinct opportunity and responsibility in this field. Consideration of all of these various interests would lend itself very well to an all-day symposium, participated in by many speakers.

In this paper we have merely scratched the surface. However, it is hoped that the few thoughts we have expressed will serve to stimulate increased effort and teamwork, on the part of all interested groups, in attaining our common goal of promoting and protecting the health and safety of our industrial population.

Evaluation of Health Education Materials

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IT is probable that every health educator has dreamed of finding a really satisfactory method of evaluating health materials—something that could be used with the ease with which we test a light bulb: put in a pamphlet, and it lights or it doesn't. It is safe to say that no such simple test will ever be devised as long as materials are prepared for human consumption. Individual phases or projects in health education can be evaluated to a certain extent, however, and such evaluation on a continuing basis is one of the functions of a health education program. This paper is a discussion of some of the methods of evaluation which have been used in British Columbia.

It would seem that a common method of evaluating a health education program is to count the number of pieces of literature distributed and the number of speeches given This statistical method falls far short of a true interpretation of evaluation. From looking at a page of such statistics, who can tell how many of the pamphlets distributed fell on the barren ground of the wastepaper basket, or how many of the speeches were delivered to deaf ears or closed minds? And again, is the question one of the evaluation of public health education materials alone, or is it a question of the evaluation of the contribution of those materials to the total public health program?

Dr. Hiscock states the problem very concisely: "The final test of health education is not how much information is distributed, but how behavior is influenced."

The statement is simple but the application of it is a challenge to every educator.

A thorough and complete evaluation of the influence of health education literature on those who read it would require extensive surveys over a period of years, and a great variety of tests to measure the changes in health practices, to say nothing of the exhaustive research necessary to eliminate the influence of other factors. Somewhere between the extremes of counting pamphlets and exhaustive surveys there are more practical methods of testing the extent to which behavior is being influenced, and health educators are in search of these methods.

A few words of explanation regarding the health education program in British Columbia might be in order. The Health Education Division was organized a little over two years ago, with one trained health educator on the

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staff. Early in 1947 a second person trained in newspaper writing was added. The assistance of a university student was obtained during the summer. In the fall of 1947 another person with post-graduate training in health education was added. This person has recently taken over other duties, and is now acting only in an advisory capacity on health education problems. This scarcity of trained health education staff means that direct consultative service to field staff is limited mainly to correspondence. It has been possible, however, through close collaboration with public health nurses and nutrition consultants who are able to visit the field more frequently, to provide assistance and obtain considerable information regarding the use being made of materials as well as the needs of each area. Much in-service education in the use of materials is accomplished during these visits. The assistance of other staff members in assessing materials has been invaluable.

Evaluation is not a process which can be applied now and then, once a month, or once a year, like an auditor's report. It must be a continuing process, day in and day out—a habit or a state of mind, in which we constantly utilize opportunities to assess the usefulness of the materials distributed, and where possible to increase that usefulness.

Since methods of evaluation differ somewhat with different types of materials, consider first the field of printed material—pamphlets, leaflets, posters, and periodicals and books—the most widely used tools of health education.

Modern authorities say that good nutrition should start before birth, and herein lies a close analogy to evaluation of pamphlets. Good evaluation should start from the moment that the pamphlet becomes an idea in some person's mind. First of all, before a pamphlet has the right to demand the time and energies of a number of people for weeks or months in its preparation, it must have a reason for being. This does not mean that one person thinks it is a good idea. A pamphlet should be produced to meet an expressed need, a need expressed by the public through the field staff, who are the eyes and ears as well as as the mouth of the public health service.

An analysis of this expressed need should assist in deciding what portion of the public will eventually read, and we hope, be influenced by the material. Is the pamphlet primarily for farmers, industrial workers, housewives? Then it must be prepared with their interest in mind. If it is to reach a number of varied groups, it should be keynoted by some point which strikes a common bond of interest.

The selection of material for inclusion in the pamphlet should meet certain tests:

(1) It should fill the purpose for which it is planned.
(2) It should be brief, with no unrelated or unnecessary material to detract from its value.
(3) It should suit the audience for which it is planned in language, style, and makeup. It should avoid the use of technical terms unless they are explained, and it should avoid "talking down" to the reader.
(4) Last, and very important, it must be attractive. If it isn't, it may be read by the people who are already interested, but it won't be read by

the disinterested people—the ones you want to reach. Unless the pamphlet can interest at least some of the disinterested, it has failed. An attractive pamphlet need not be expensive. The use of colour, appropriate type and generous margins will do much to provide a pamphlet of pleasing appearance.

Several procedures have been found helpful in the planning and preparation of materials in this province. First the pamphlet is discussed by a group of persons directly concerned with its preparation. If it is to be a pamphlet on public health nursing, then a public health nurse and a health educator work together to plan the draft copy. They consult health unit directors and other public health nurses, both in the central office and in the field, to obtain their advice and suggestions. Whenever possible. a sample of the group for whom the pamphlet is intended would be consulted for their impressions and suggestions. Although this is a time-consuming process, it has eliminated many errors which otherwise might have passed unnoticed until too late. Close collaboration on, and careful assessment of pamphlet material before production is an important first step in producing material which will meet the needs for which it is being prepared. It is important to emphasize the value of obtaining the comments and criticisms of members of the field staff. The value of a different viewpoint (and no matter how closely you work with the field staff, they do have a different viewpoint) should not be overlooked, particularly when it is the viewpoint of those who are working directly with your customer—the public.

Once the pamphlet is ready for distribution, a new possibility both for testing and increasing the usefulness of materials presents itself. When the pamphlet is made available to the field staff for distribution, it should be accompanied by a careful analysis of its purpose, and suggestions regarding its use and limitations. In discussions with field personnel valuable information concerning the use and effect of various materials can be obtained.

Local health units frequently devote time at staff meetings to evaluation of new materials, and summaries of their discussions are useful information for the health educator in planning new materials.

Most provincial health departments find it impractical to produce all their own printed materials. Suitable materials may in some cases be purchased, or obtained free from commercial sources. Adopted materials, like adopted children, should be carefully selected and their suitability determined. Certain criteria should be considered in choosing such materials:

(1) Do the statements contained in the material conform to the policies of your department? Much confusion can be created by the use of literature containing statements conflicting with information already given out by the public health staff.

(2) Could the material be classed as advertising? As a government agency the health department can hardly afford to risk the practice of distributing advertising materials for commercial companies merely because the material is attractive, available in large quantities and free.

(3) Is the same information available in material already in use? Two or three similar pamphlets on the same topic merely cause confusion and

take up valuable space. The busy public health nurse who has little enough time to digest and assess pamphlets is then faced with deciding which of three similar pamphlets she should use. This difficulty is particularly common in the field of maternal and infant literature.

Other visual aids such as posters and exhibits are frequently requested health education materials. Attractive posters which are useful for teaching purposes are popular for child health clinics and schools, but their value depends largely on how they are utilized. A poster which is used by a teacher or a nurse to emphasize or explain a point in her discussion will be far more effective than one which is merely placed on the wall as a decoration. The production of really attractive posters is a more expensive procedure than producing pamphlets, particularly when their relative teaching value is considered. The necessity for mass production and the relatively small numbers needed on a provincial level limits the variety which can be produced in any one province, consequently outside sources are usually utilized as much as possible.

A health educator working on a limited budget is faced with such problems as whether money would be better spent on a poster or a booklet when both are needed. No attempt can be made here to discuss questions of budgetting, except to say that it is important to consider what materials will be most used and most effective for a given amount of money.

Exhibits in the main are of more value as publicity than as education—not that publicity is not necessary! Exhibits must have eye appeal, and perhaps of all visual materials benefit most from the professional touch. Window displays, booths at fairs, and floats, are planned to focus attention of the public on one organization; for example, window displays during public health nursing week. The expert use of colour and line or movement, combined with simplicity, is essential to produce an eye-catching exhibit. The teaching value of these devices is limited except where they are used in conjunction with a talk or a demonstration.

Posters, exhibits, or bulletin board displays, may, if well used, be valuable aids in staff education.

Another type of material which plays an important part in a health education program is the study outline. Requests for such outlines for public health nursing study groups and for courses in public health for students nurses are frequent in this province. It has been possible to assess the value of these to some extent through the success of the courses, and the increased interest shown by the participants. One project in particular, which dealt with the preparation of reports which public health nurses present to their advisory committees, has shown tangible results in more carefully prepared reports and more enthusiastic advisory committees.

The preparation of staff education materials, although one of the least spectacular phases of health education, is one which can bring rich rewards for the time expended.

A discussion on health education materials would not be complete without a mention of press releases. Mention of press releases reminds me of an incident which occurred recently. The director of public health nursing addressed a group

in a Vancouver Island town a few weeks ago. In her talk she made the statement that one public health nurse can give adequate service to approximately 5,000 people, if bedside care is not included. The press statement on this was, "One public health nurse in 5,000 gives adequate service".

This incident points out a number of possibilities for improving press releases. The practice of preparing a summary for the press of the speech to be given will help to avoid errors, and will win the approval of the busy reporter. Time spent in discussing with the editor the policies of the local health department will help to increase his understanding and interest in the public health program. A knowledge on the part of health unit personnel of what is considered news, how it should be prepared, and when it should be submitted to meet deadlines, will aid in getting good coverage of local public health activities.

Statistics make good newspaper copy if they are well presented. A narrative interpretation of significant statistics submitted at regular intervals will be used where the same statistics presented in tabular form with no interpretation may be omitted or misinterpreted.

Newspapers can do much to keep the public informed and interested in public health. Good relations with the press and a mutual understanding of problems is essential to a good health education program.

Probably the most popular visual aid in use at present is the 16 mm. film. When educational films first came into common use, the anticipation of seeing a film was a definite drawing card for meetings. The result was that educators, including public health workers, tended to use films as entertainment, rather than as education. This tendency has not been entirely overcome.

Since most provincial health departments purchase, rather than produce their films, evaluation begins with the selection of films for purchase. A film survey committee can provide valuable assistance to the health educator in this task, particularly in noting technical errors in the film. Such a committee can be flexible; that is, if a film on infant care is to be previewed, the committee would include public health nurses, physicians, and nutritionists, in addition to health educators. Films on sanitation would be previewed by the sanitation staff and health educator. On some occasions the inclusion of clerical staff to obtain a sample of the layman's viewpoint is also useful.

Once a film has been purchased, the next task is that of getting out information regarding the contents of the film, the type of audience and locality for which it is suited. The field staff receive this information through a monthly newsletter, and again through supplements to the film catalogue. Through the newsletter, the film catalogue, correspondence and personal consultations there are opportunities for emphasizing methods by which film showings may be improved. Some of the essentials which should become routine practice are

(1) A film should be selected which is directly related to the topic of the meeting. If a suitable film is not available, it is better to use no film than one which distracts the attention of the audience from the subject under discussion.

(2) The speaker should preview the film before the meeting to be sure it is suitable for the purpose intended, as well as to plan introduction and

discussion material to accompany it. The tendency to use any film, whether it is suitable or not, is one extreme. The other extreme is equally undesirable—the tendency to reject a film because it does not fit to the letter the program to be discussed. The speaker can to a certain extent adapt the film to his program through pointing out small differences or discrepancies between the film and the program under discussion.

(3) Some thought should be given to the place of the film on the program. The best utilization of a film can be made by pointing out what the film teaches before it is shown, so that the audience knows what to look for. Then, following the film, the application of the points taught to local conditions, and opportunity for audience discussion, will help to impress the lesson of the film on the minds of the audience.

(4) Good technique in film showing is essential. Adequate preliminary arrangements and testing of equipment is necessary to avoid confusion and delay. The speaker is wise to plan for someone else to run the projector so that he may concentrate on his presentation. Where local film councils are in operation it is usually a simple matter to arrange for a volunteer operator.

Some assessment of the usefulness of films in use can be obtained from the comments on film record cards which accompany each loan print. A number of local health unit staffs have a film evaluation project in which they obtain one or two films as they are available and hold a staff preview and discussion. From these previews it is possible to assess the usability of the film in that district and plan a program for its use.

Films when properly used can be a powerful aid in influencing opinion and behavior. Health educators, however, must be constantly on the alert to exert influence to improve both the quality and the utilization of educational films.

Another medium which can be a valuable aid in influencing health behavior is the radio. During the past year some experiments in the use of this medium have been made in British Columbia.

This province presents a unique situation with regard to radio. The topography of the province is such that certain areas can be reached satisfactorily only by local stations. This has led to the development of numerous small stations throughout the province, planned to cover the immediate locality. Local health departments in some of these areas have been offered time on the air for regular programs. This, at first glance, sounds like an excellent opportunity, especially to someone who has never written a regular program. It has proven to be a mixed blessing, but it has provided opportunities for evaluation in the use of radio programs.

One health unit director in the interior has carried a weekly 15-minute program for several months, in which he has used talks and interviews presented by the staff. His original plan was to have all the staff take turns in preparing and presenting radio talks. Since this health unit covers a wide area, this meant that some of the staff members had to travel long distances with uncertain road and weather conditions to present their programs. Any unforseen delay might

necessitate the last-minute cancellation of the program. Since small stations do not always have facilities for transcribing programs, it means that the people presenting the program must be on the spot at the right time. In addition, the time required to prepare these programs locally places a heavy load on the staff.

On the credit side of the picture there are several factors to be considered. Local programs presented by or including persons well known in the community are of wide interest. People in a rural community are interested in listening to friends or acquaintances speak on the radio, and are interested in talks about their own community.

During the past few months another type of program has been tried and is proving very popular. It presents an excellent means of obtaining good radio coverage with a minimum amount of effort. The C.B.C. Women's Commentator in Vancouver conducts a daily 15-minute program for women at 10 a.m. For the past several months, the Tuesday program in this series has been devoted to health problems, particularly child health and nutrition. For this program a supply of questions typical of those asked by mothers, with the answers, was prepared with the help of a group of public health nurses, who noted questions asked at child health clinics. After a few weeks sufficient questions came in from the listening public to provide sufficient material for the broadcast. The questions were forwarded to the provincial health department for reply, and the answers were included in the next week's program.

The advantages of this arrangement are obvious—the opportunity to obtain a "ready-made" audience through the use of a popular program, and the saving of time and effort by eliminating the necessity for writing script and presenting the talk. The questions and letters which have resulted from this program give evidence that it has a wide listening audience. From conversations with public health nurses there is further evidence that the program is attracting wide attention.

Another factor in favour of this type of program is that it is directed to a specific audience, in this case, the housewife, in the midst of morning routine, and is planned to suit that audience. Planning a radio program for a specific audience is an important consideration sometimes overlooked by public health personnel with little experience in radio.

Much more experimenting is necessary to determine the value of health programs on the radio, the listening audience which a regular program attracts and the extent to which the program influences this audience.

In conclusion it is important to stress again that evaluation is a continuing process. Constant evaluation is the lifeblood of a good health education program. Health educators must cultivate an evaluative consciousness in order to be able to guide public health workers in the development of sound practices in the assessment of materials. Evaluation, like any other phase of a health education program, is a cooperative process, in which all health department personnel can and should take part, and the health educator has an important role to play in developing sound methods of evaluation.

Current Immunization Procedures of the Canadian Army

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IT is considered that the immunization procedures used by an army require constant critical examination. This is necessary to ensure that procedures which have become obsolete are not continued and, conversely, to ensure that the army is not neglecting any means of protecting the health of the soldier. If a vaccination or immunization is to remain in effect in the service or if a new procedure is to be adopted, it must satisfy certain military requirements. The fundamental purpose of an army during war is to fight and during peace is to train for war. If an immunization procedure prevents disease and its application requires less loss of time than the disease itself, it increases the manpower available for fighting or training and hence is justified. When authority is obtained to vaccinate or inoculate a soldier, the latter, unlike a civilian, does not make the decision whether or not he will be vaccinated or inoculated; on the contrary, it becomes an offence under military law for the soldier to refuse vaccination or inoculation. The psychological effect on the morale of the soldier in knowing that as far as possible he is protected against disease is another factor which cannot be neglected. It follows that, such being the case, immunization procedures should not be introduced into a democratic army until they are well proven to be beneficial to the soldier and the army. With these conditions in mind and with a brief review of the 1939-45 experience, it is desired to examine the immunization procedures used by the Canadian Army and to determine whether this program requires deletions or additions.

At present a recruit entering the army is vaccinated against smallpox; he is given a Schick test and, if this is positive, he is given diphtheria toxoid; and he is inoculated with T.A.B.T. (typhoid, para A and B, and tetanus toxoid combined). In the event that he is proceeding overseas to certain parts of the world, he is inoculated with typhus vaccine. Inoculations with yellow fever, cholera and plague vaccines are provided to the occasional serviceman proceeding to an area where such protection is required. Let us examine these procedures to ascertain if they fulfil the requirements outlined above.

Smallpox Vaccination

For many years it has been standard practice to vaccinate the soldier against smallpox. In the event that his family occupy government quarters, they are

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also required to submit to vaccination. The serviceman is required to be revaccinated every three years. The Annual Health Report, 1944, of the Canadian Army Overseas records two cases of smallpox, both in Italy, and the report states that although both these men had been vaccinated, vaccinations had not been done during the two years preceding the infection. There does not appear to be any question about the necessity of this proven procedure although some controversy might arise as to the frequency with which revaccination should be done. The three-year interval, which is supplemented by revaccination whenever a serviceman proceeds outside Canada, seems to be satisfactory.

Diphtheria

Apparently at the beginning of the 1939-45 war it was decided that immunization against diphtheria was not feasible for the Canadian Army. The reasons motivating this decision may have been that it was considered at the time that the administration of toxoid to the army would cause a greater loss of time than would the number of cases of diphtheria expected. In Canada an order appears, effective 1 March 1944, that personnel of active units and formations of the Canadian Army who are of overseas category and who show a positive reaction to the Schick test will be required to be immunized against diphtheria. It was not until January 1946 that an order was issued to the effect that all personnel who show a positive Schick test will be inoculated against diphtheria and that either alum-precipitated or fluid toxoid may be used. Schick-negative personnel are required to have the Schick test repeated in twelve months. This is the current position in the Canadian Army Active Force. According to the Annual Health Report of 1944, the Canadian Army Overseas gave consideration in 1944 to immunization against diphtheria. The procedure was decided against in the Northwest European theatre of operations, whereas in the Italian theatre it was decided to provide immunization. In December 1944 the Canadian Corps in Italy were immunized as follows: 1/10 cc. of diphtheria toxoid was administered subcutaneously, those with no untoward reaction were given 1/2 cc. one week later, and those who still had no reaction were given 1 cc. subcutaneously three weeks later. Subsequent follow-up tests tended to show that the results of this program were successful in lowering the incidence of diphtheria, but operational commitments did not permit an adequate follow-up. The 1945 Annual Health Report, Canadian Army Overseas, states that a program of active immunization against diphtheria was instituted for the Canadian Army Occupational Force in September and October of 1945. The majority of cases developing subsequently were in personnel recorded as Schick-negative. What was the incidence of diphtheria in the Canadian Army? Information available at Army Headquarters records 510 cases of diphtheria in Canada in the 1939-45 period. In 1944 in the Canadian Army Overseas there were 725 cases of diphtheria, giving a rate of 2.88 per 1,000 per year. This was made up of 37 cases in the United Kingdom, with a rate of 0.28 per 1,000 per year; 506 cases in the Italian theatre, with a rate of 7.03 per 1,000 per year; and 182 cases in the Northwest European theatre, with a rate of 3.25 per 1,000 per year. In 1945 the incidence of diphtheria overseas increased to 2,412 cases, giving a rate of 10.06 per

1,000 per year. In the United Kingdom there were 87 cases, a rate of 1.06 per 1,000 per year. In Italy there were 350 cases, but the rate is not given as the Corps moved early in the year, making it impossible to calculate a rate. In the Northwest European theatre in 1945 there were 1,975 cases of diphtheria, giving a rate of 14.8 per 1,000 per year.

In 1944 in the Canadian Army Overseas, there were 4 deaths from diphtheria—2 in Northwest Europe, 1 in the Italian theatre and 1 in the United Kingdom. In 1945 there were three deaths, all in Northwest Europe. Amongst approximately 1,500 Canadian prisoners of war taken at Hong Kong in 1941, 418 cases of diphtheria, with 54 deaths, occurred between September 1942 and February 1943. In 35 of the fatal diphtheria cases, antitoxin was not available. Lt.-Colonel Crawford of Army Headquarters, who was a medical officer with these prisoners of war, speculates that the high incidence may have been due in part to the extremely poor conditions under which prisoners were existing, so that their normal body defences were reduced. From the above it seems apparent that whilst a military force is living in countries where the incidence of diphtheria is low, there may be some argument that immunization against diphtheria is not justified, but as a military force is liable to serve anywhere, the active immunization of such a force would appear to be indicated.

Tetanus

Inoculation with tetanus toxoid was introduced into the Canadian Army in 1939. In 1941 tetanus toxoid was combined with T.A.B. vaccine and these antigens were administered as T.A.B.T. As far as can be ascertained, only three cases of tetanus were reported in the Canadian Army during the 1939-45 war. Reports of these cases are contained in the Canadian Army Overseas Annual Health Reports, 1944-45. Two cases are reported in 1944 in Northwest Europe and one from Italy in 1945. One of these cases received an inadequate dosage of tetanus toxoid and for another the information available is incomplete. There appears to be only one case with a record of adequate tetanus toxoid inoculation who developed tetanus. There were no fatal cases. In the 1914-19 war, in the British Expeditionary Force, the incidence of tetanus per 1,000 wounded was 1.5, with a case fatality of 50 per cent. Therefore this procedure appears to be amply justified, although the frequency with which a booster dose is given probably requires discussion. At present a booster dose is given every year along with the annual injection of T.A.B. vaccine.

Typhoid and Paratyphoid Fever

T.A.B. vaccine was used by the Canadian Army in both the 1914-18 and 1939-45 wars. During the second war in the Canadian Army Overseas there were 45 cases of typhoid fever during 1943, 1944 and 1945, one in the United Kingdom and 44 in Italy. It is not claimed that this low incidence of typhoid fever is entirely to the credit of typhoid vaccine but it is felt that it is due to a combination of good sanitation, good water and food supplies and to T.A.B. vaccine. It is considered that there would have been a greater incidence of typhoid fever if the extra protection given by the vaccine had not been available. There were many occasions when operational necessity or disregard of discipline rendered

non-operative good sanitation and it is felt that on these occasions immunization with typhoid vaccine prevented outbreaks of typhoid fever. There were not any deaths from typhoid fever. The conclusion is reached that although this vaccine is not in the class of smallpox vaccine or diphtheria and tetanus toxoid nevertheless it is worthwhile insurance for an army.

Epidemic Typhus Fever

Typhus fever inoculation was instituted in the Canadian Army with effect from January 1, 1944. As far as can be ascertained, there were not any cases of typhus fever in the Canadian Army during the 1939-45 war. The credit for this accomplishment cannot be given to typhus fever vaccine, as the advent of DDT provided an effective weapon for the prevention of this disease. It is felt, however, that, like T.A.B. vaccine, typhus fever vaccine is justified, as it affords protection against epidemic typhus fever when the sanitation barrier is broken either through operational necessity or poor discipline. Typhus fever vaccine is not now used as a routine procedure but it is considered that it should be given to troops if they are proceeding to an area where typhus fever is prevalent.

It is not considered that any deletions from vaccinations and inoculations at present given to the army are indicated. It is hoped that in the future it may be possible to decrease the number of injections, either by combining more antigens or by decreasing the frequency of inoculations. Are there any procedures which should be added to this program? Influenza vaccine has been considered but up to the present it has been felt that such factors as the short period of immunity conferred, the number of types of influenza against which it does not give protection, and the reaction to the inoculations prevent the introduction of this inoculation as a routine procedure. The value of B.C.G. vaccination for the Canadian Army is a subject for speculation. The rates of tuberculosis in the Canadian Army Overseas including pulmonary tuberculosis, extra-pulmonary tuberculosis, tuberculous pleurisy and idiopathic pleurisy rose from 0.50 per 1,000 per year at the beginning of the war to over 2.00 per 1,000 per year in 1944. The 1945 report notes a tendency towards a greater incidence of tuberculosis in personnel who come from parts of Canada where there is a low incidence of tuberculosis. This suggests that it might be of value to carry out tuberculin tests on the army and if the results indicated that sufficient numbers were tuberculin-negative, consideration be given to vaccination with B.C.G.

The immunization procedures employed in the army at the present time have been discussed in the light of the experience of the recent war. Two possible additions to these measures have been mentioned. This paper has been given with the hope that the army program of immunization will be subjected to critical examination and discussion by this meeting.

Intestinal Parasites of Eskimos on Southampton Island, Northwest Territories

A PRELIMINARY SURVEY

MALCOLM BROWN, R. G. SINCLAIR, L. BRUCE CRONK and GEORGE C. CLARK[1] with E. KUITUNEN-EKBAUM[2]

THERE is very little information about parasitic infections of the northern native population of Canada and the authors are not aware of any published reports on parasitological findings among this population which would be comparable with the surveys carried out in southern parts of the country (1, 2, 3, 4).

Parnell (5) during his investigation of animal parasites in North-east Canada examined some nail scrapings from Eskimos who were being medically examined for various reasons. The incidence of enterobiasis seemed to be high, as eggs were found from patients at various posts. The author suggested that some of the deaths among Eskimos might have been due to a form of appendicitis caused by pinworm. He did not give the number of patients examined nor any other data on these findings.

The present report gives the results of the examinations of specimens collected from the native population of Southampton Island, Northwest Territories, during the summer of 1947.

Procedure and Results

Material for this survey included 83 NIH swabs and 31 faecal samples. One NIH swab was taken from each of 64 individuals of one group; one swab and one faecal sample from 19 individuals of a second group; and one faecal sample from each of 12 individuals of a third group. This material was obtained from 79 males and 16 females whose ages ranged from 6 months to 67 years. Of the 95 persons examined, 33 or 34.7 per cent were infected. Four different species of parasites were found: 2 species of protozoa, 1 species of cestode, and 1 species of nematode. Only one species of parasite was found in each of 30 individuals, and 3 persons were each infected with 2 different species.

NIH Swab Examinations:

NIH swab examinations for the presence of *Enterobius vermicularis* were made in 83 individuals, 77 males and 6 females. The swabs were taken at various times of the day by the same investigator. Sixty-three of those examined belonged to 21 family groups. In no one family were all the members examined, but in 9 families swabs were obtained from two members,

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in 7 families from three members, in 3 families from four members, and from five and seven members of two other families. The remaining 20 cases were drawn from as many families. The results of the examination of the swabs are given in Table I.

TABLE I

RESULTS OF EXAMINATION OF 83 NIH SWABS AND 31 FAECAL SAMPLES

No. of samples examined	Parasite	Males		Females		Number Infected	Males		Females	
		No.	Ages	No.	Ages		No.	Ages	No.	Ages
83	*E. vermicularis* ..	77	6 mo. - 67 y.	6	9 mo. - 35 y.	25	23	5 - 67	2	5 - 35
31	*Diphyllobothrium* sp.	21	2 - 67	10	5 - 50	9	6	14 - 67	3	12 - 27
	Endamoeba coli ..					1			1	41
	Giardia lamblia ..					1			1	32

The table shows that of 83 cases examined, 25, or 30 per cent, were infected with pinworms. The ages of the infected individuals ranged from 5 to 67 years; 7 children examined were below 5 years of age, but no ova were found on their swabs. There was no apparent difference in the incidence in males and females. The number of females examined was very small; it included only 1 adult and 5 children.

Of the 21 groups made up of more than one member of the same family, 5 were negative. The 5 families represented were drawn from three different encampments. In the other 16 groups, one or more members were positive, but in no case were the swabs of all members positive. In one case only were the ova of *E. vermicularis* found in the faecal sample.

Examination of Faecal Samples

A total of 31 samples were obtained, one sample per person. The samples were preserved in formalin until examined about two months after being collected. This group included 21 males and 10 females, their ages ranging from 2 to 67 years. Eighteen were members of 6 families; specimens were obtained from two members of 4 families, from four members of another and from six of another. The remaining 13 subjects were drawn from the same number of families. Ova of a *Diphyllobothrium* species were found in 9 cases. Two of the cases showed ova on NIH swabs. It cannot be definitely said whether the parasite is *D. latum*, although the ova closely resemble those of the latter. An effort will be made to obtain mature specimens of the tapeworm to identify the *Diphyllobothrium* species.

Endamoeba coli was found in one sample and *Giardia lamblia* in another.

Eosinophilia

Examination of blood smears taken from the entire group of natives examined by the party showed a strikingly marked eosinophilia in a large proportion of cases. Blood smears were obtained from 79 individuals from whom a specimen for parasitological examination was also obtained and the percentages of eosinophils found in these smears are shown in Table II.

TABLE II

PERCENTAGES OF EOSINOPHILS AND THE PRESENCE OR ABSENCE OF INTESTINAL PARASITES IN 79 INDIVIDUALS

Percentages of Eosinophils ..	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	26	56
No. of cases of *E. vermicularis* ..	1	6		2	2	2		1	3	1				1			1
No. of cases of *Diphyllobothrium* sp.	1	1			2	2											
No. of cases of *Diphyllobothrium* and *E. vermicularis*	2								1								
No. of cases of *Giardia lamblia* ..		1															
No. of cases of *Endamoeba coli* ..			1														
No. of negative samples		5	2	7	9	2	4		4	3	2	2	1	2	3	2	

Eosinophilia may sometimes be associated with enterobiasis. Table II shows that in these cases there is no correlation between eosinophilia and intestinal parasitic infection as demonstrated by the methods used.

COMMENTS

The purpose of this survey was to determine the incidence of parasitic infections among the natives in an isolated area of the Canadian Sub-Arctic.

The percentage incidence for the parasites found is presumably much lower than that which actually exists in the group involved. Unfortunately it was not possible to make more than one NIH swab examination on each person. Had repeated swabs been taken, these would certainly have increased the number of positive cases. The familial nature of pinworm infections is well established and, therefore, it is likely that under primitive, crowded conditions and low standards of sanitation, all members of the families where the infection occurred would be infected. Surveys in the United States and Canada have shown that at least 7 swabs on different days should be taken before negative results can be established. Earlier experience has shown that in some cases 10 or 15 swabs on consecutive days could be negative in known persistently positive cases. On the basis of previous NIH swab surveys, an estimation can be made that the incidence of enterobiasis in this group would be closer to 70 or 80 per cent.

The incidence of infection with *Diphyllobothrium* species is much higher than the recorded incidence for *D. latum* in southern parts of Canada.

Further studies of the mature parasite will be necessary to determine whether or not the species found among these Eskimos is *D. latum*.

The reason for the comparatively low incidence of protozoan infections remains conjectural. It is probable that the incidence would be higher if repeated stool examinations were possible, or it may be that a dietary factor has kept the incidence at a low level.

A matter of considerable interest is the high degree of eosinophilia which seems to bear no relation to the parasitic findings of this survey. Further investigation is under way.

SUMMARY

A study of intestinal parasites among 95 Eskimos on Southampton Island, N.W.T., showed that 33 individuals, or 34.7 per cent, were infected with the following parasites: *Enterobius vermicularis* (22 cases), *Diphyllobothrium* sp. and *E. vermicularis* (3 cases), *Diphyllobothrium* sp. (6 cases), *Endamoeba coli* (1 case), *Giardia lamblia* (1 case). The specimens examined were 83 NIH swabs and 31 faecal samples.

A varying degree of blood eosinophilia, up to 56 per cent, was found in 79 cases examined. There appeared to be no relation between the percentage of eosinophils and the parasitological findings recorded.

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Canadian Journal of Public Health

THE ENLARGING FIELD OF SANITATION

IN describing the development of public health over the years, it is customary to indicate that the early period consisted largely of the application of sanitary knowledge, particularly as applied to drainage, plumbing, sewage disposal, and water purification. As one considers the environment and the living habits of people today, it is appreciated that sanitation now includes many other fields. During the past ten years, developments in food distribution and service have been so numerous that many new problems have been created. Two references are sufficient to indicate the appreciation of the enlarging field of sanitation.

The American Public Health Association, through its Committee on Professional Education, has recently presented for consideration new educational qualifications for sanitarians.[1] It has been pointed out that sanitarians constitute the second largest group engaged in health activities in official departments. Their work, more than that of any other group except the public health nurses, brings them in close contact with the general public. It is proposed that an appointment as "supervising sanitarian" shall be filled by a university graduate who has had one year of graduate study in sanitary science and public health and three years of public health experience; and that a "sanitarian" engaged in an environmental hygiene program shall have two years of university education with one year of public health experience and a special curriculum occupying at least three months. In several States it is required that the sanitarian be a university graduate with experience in public health. A survey has shown that at least five universities in the United States are now offering or are prepared to offer undergraduate courses leading to a degree of B.Sc., specializing in sanitation. In several universities, courses in sanitation occupying two or three years are being given. The whole subject of the training of sanitarians has received much study in the United States during the past three years, and there is unanimity in regard to the requirement ultimately of a university course suitably planned to prepare the sanitarian for his duties and providing postgraduate training for those who wish to serve in senior appointments. The present requirement of two years of university training must be regarded as a step towards this objective.

[1]Am. J. Pub. Health, 1948, *38*:1003-1007.

Another significant development in the United States has been the work of the National Sanitation Foundation, of which Dr. Henry F. Vaughan is president and which is intimately associated with the School of Public Health of the University of Michigan, at Ann Arbor. Last June a series of panel discussions was arranged under the designation of "the first National Sanitation Clinic." Public-health and industry were equally represented. Three hundred members were in attendance and the clinic occupied five days, with two sessions each day. The clinic consisted of twelve sections, including sanitation, education, sanitation supervision and administration, deodorants and sanitizers, food handlers' training program, food protection, rodent and insect control, food service equipment, vending machines, soda fountain installations, etc. The findings of each panel have been presented in a comprehensive report which gives the recommendations in each field.[2]

The clinic defined the field of sanitation as including: an adequate, safe, potable water supply; adequate, clean, safely pasteurized milk supply; the supervision of foods and food handling, including instruction in personal hygiene and the hygiene of food handling; a safe method of wastes disposal; the health aspects of housing; the control and supervision of swimming pools and bathing areas; insect and rodent control; proper sanitation of schools; a program of accident prevention, and a cooperative effort with industry to assure the health protection of workers. This program of sanitation should, in the opinion of the clinic, be a major function of the health department, and should be carried on by a major administrative entity of the department. Retail food sanitation can be most effectively carried out by local authorities; hence, it is strongly recommended that food sanitation be a function of local health departments.

The findings of the National Sanitation Foundation Clinic indicate the urgent need for both basic and applied research in every branch of sanitation. As a result many studies will be undertaken by government departments, universities, and industry. The clinic also stressed the fundamental importance of the training of personnel in sanitation. The informal training of the past must be replaced by adequate courses of instruction. The provision of a suitable undergraduate course leading to a university degree in sanitation was urged as the ultimate solution to the problem, together with the provision of postgraduate instruction in sanitation as offered by schools of hygiene.

The need was also stressed for the establishing of a sanitation testing laboratory which would permit the testing of new products in cooperation with industry. The government departments concerned are giving much thought to possible regulations relating to detergents, disinfectants, insecticides, rodenticides, etc. Such regulations must be based on studies, and research in these fields is being conducted in a number of centres. The field of sanitation is expanding rapidly, and commercial interests are frequently moving in advance of adequate information about the value or the safety of products. A product which may have been shown to have value under carefully controlled

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[2]The report is available at $1.00 per copy from the National Sanitation Foundation, School of Public Health, University of Michigan, Ann Arbor.

conditions in the laboratory may be marketed, and inferences and claims made which are unwarranted. There is urgent need for research in the newer developments, and for the formulation of suitable regulations to safeguard the public.

The Canadian Public Health Association has taken an active part in the training of sanitary inspectors. In 1935 educational requirements were established and a course of study outlined, and since that time the majority of those now serving in the field have met these minimum requirements. In the light of today's needs in sanitation, thought must be given to improving the training of personnel in this field. Consideration must be given not only to the immediate requirements, but also to the training which should ultimately be provided if the sanitarians of tomorrow are to render the service which will be required of them and to meet the opportunities which will be presented for the application of sanitation in all its branches.

Sanitary Inspection

THE NEWER INSECTICIDES AND RODENTICIDES IN RELATION TO IMPROVED PEST CONTROL

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THE sanitary inspectors of Canada are doing an admirable job in improving the conditions in the public eating places throughout the Dominion. To date the bacteriological phases have been stressed very largely. The education of management and personnel in proper methods of handling food and the washing and sterilizing of the various utensils used in the preparation and dispensing of the daily bread of those who eat in public places is most commendable.

I would like to direct your attention to another phase of the problem, one which, at times, does not receive adequate attention from the proprietor and his staff. I refer to the often ever-present insect and rodent problem.

The role of the housefly as a carrier of disease is too well known to require any comment. The common rat is host to several species of fleas; and mites are found as well on both the mouse and rat. Both these parasites can transmit disease to the human population. All of the insects and rodents which invade the home and public eating establishments offend our aesthetic sense. No one likes to think of eating food which has been crawled over, pawed, or contaminated by these pests.

Insect control in the washrooms of some public eating places requires drastic improvement. I recall one case where the flies could commute directly from the washroom to the kitchen through a large opening near the ceiling. I did not sample the food!

The maintenance of pies and other food on shelves beneath the counter where cockroaches, flies, and rodents can visit them after closing time, or before, is a practice which should be outlawed. It is not very stimulating to the appetite to find the evidences of such contact in or on the food.

Improved Sanitation Standards in the Manufacture and Handling of Foods

In the United States a great deal of attention has been paid, particularly in the past 10 years, to the matter of contamination in foods, and both Federal and State authorities have taken an active part in this program. The Federal activities are carried out by the Food and Drug Administration who concern themselves with food manufacturing establishments such as flour mills, bakeries, canning plants, etc., and materials generally which enter into inter-state commerce. Their work is handled in 16 field laboratories with a total field force of 230 inspectors. While the Federal activities may take them into hotel kitchens and other places at times, most of the local work is left to the State and city authorities.

In many cases, the State legislation is all-inclusive, taking in manufacturing plants as well as retail outlets of all types. In addition to the bacteriological angle, the insect and rodent problem is a primary consideration in the

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rating of the premises or the product as free from contamination.

In the United States, products are deemed to be adulterated if they contain filthy, decomposed, or putrid animal or vegetable substance; which from the pest point of view includes insects, insect pests, insect excrement, rodent faeces, urine and hairs. Furthermore, the product is viewed as adulterated if the food has been prepared, packed, or stored, under insanitary conditions where it *may* have become contaminated.

Attention has been called to the regulation in effect in the United States because the Dominion Department of Health is now considering a general raising of the sanitation standards in food manufacturing and handling, based in a general way on the program now in effect in the United States.

While war is very destructive to human life, great scientific progress is often made in such periods. During the recent conflict, a vast amount of research work was done in connection with insecticides and rodenticides and the program is still being pursued energetically. Many thousands of materials have been examined to determine their value as pesticides. I would like to review briefly some of these materials and point out their relation to improved methods of pest control.

All pesticides offered for sale in Canada must be registered under the Pest Control Product Act. The purpose of the Act is to ensure that the public may purchase materials which in use will give the results claimed by the manufacturer or vendor. Before registration is granted, the ingredients, guarantee, purpose, directions, and text of the labels are reviewed by the Science Service of the Department of Agriculture.

Twinn (5a) has given a very good account of the recent development in pesticide materials.

Insecticides

DDT or 1-trichloro-2, 2-bis (p-chlorophenyl)-ethane

DDT is at present the most widely used and most efficient of the newer insecticides. Originally prepared in 1874 by Zeidler (6), it was found to be of insecticidal value by the Swiss dyestuffs firm of J. R. Geigy in 1939. During the latter part of the War it established a remarkable record in controlling insect carriers of disease and received an extremely large amount of publicity. This material is very effective against many different kinds of insects and in addition has a prolonged residual action. Hundreds of papers have appeared in recent years discussing the formulations, application, and necessary precautions in the use of DDT.

This insecticide was first available in Canada as a barn spray containing about 5 per cent of the active ingredient in kerosene for the control of flies in buildings housing livestock. More recently it has been available as oil solutions, emulsions, aerosols, and powders (both in the dry state and for use in the form of water suspensions). The Pesticides Administration sets the amount of DDT which may be included in any product registered under the Act. At present, all products containing 0.5 per cent or more of DDT must be labelled at poisonous.

Oil sprays used in buildings may be divided into residual or surface sprays and space sprays. The purpose of the former is to lay down a toxic deposit on the surface of the space treated which will kill insects which come in contact with the treated surface some time after the application is made. The space sprays in general affect only the insects actually contacted at the time of application.

One of the outstanding features of DDT is its residual action. The normal DDT surface spray contains about 5 per cent by weight of DDT in a refined oil. Such a spray is applied directly to the surface and, by the drying of the carrier, a deposit of DDT crystals is left which may continue to kill insects over a prolonged period. In certain cases, small percentages of other insecticides are added to the spray to increase the speed of knock-down.

Air or space sprays, on the other hand, may contain from 0.5 to 1 per cent of DDT as well as sufficient pyrethrum extract or thiocyanates to kill flying or crawling insects even without the addition of DDT. There is little, if any, residual effect with sprays of this type, and the purpose of the DDT is merely to increase the killing powers of the other toxicant.

DDT emulsions are also used in buildings where it is desirable to avoid any fire hazard while the spraying operation is being carried out. For the most part they consist of 25 per cent DDT in oil plus an emulsifying agent. The emulsion is mixed with 4 parts of water to yield a 5 per cent residual spray.

DDT is also very commonly used as a water suspension. Concentrations as high as 50 per cent of DDT in powder form are available for dilution with water. One pound of the powder is mixed with one gallon of water to produce a suspension of approximately 5 per cent DDT for application as a residual spray.

When DDT is to be used in powder form, it is ground with an inert material such as pyrophyllite or talc. Where no other insecticidal ingredient is added, the material is used in dry form against human and animal parasites and household and industrial pests in the form of a 10 per cent powder.

Aerosol bombs became very popular during the War to kill flies and mosquitoes in buildings and other shelters used to protect the armed forces from insect-borne diseases but they are also quite effective against other species of insects. More recently the bombs have contained DDT, an auxiliary solvent, pyrethrum extract, and utilize freon as the propellent. When the valve of the bomb is opened, a fine mist is discharged from the bomb and spread throughout the treated space by the freon gas.

The proper application of DDT in appropriate formulations now enables much more effective control of common species such as the housefly, the bedbug, and the cockroach. The thorough application of DDT in spray or dust form in locations where bedbugs hide, or must cross to find their hosts, not only eliminates existing infestations but prevents re-infestation for many months. This material does away with the necessity for fumigation, which was dangerous, expensive, and afforded only a temporary relief because of the likelihood of re-infestation.

Through the use of suitable formulations of DDT, serious cockroach infestations have been completely eradicated.

Spectacular results have been secured by the use of DDT against house flies. The treatment of the interior of buildings with a DDT residual spray and regular spraying and proper disposal of fly breeding materials, on a community-wide basis, could dispose of the fly problem in a few seasons.

Mosquitoes are even more susceptible to DDT than house flies, and the residual sprays remain toxic to them for long periods of time. This material has also aided greatly in the elimination of breeding places out-of-doors.

DDT has also been used very effectively to combat insects in food warehouses. One application per season in oil or water suspension greatly reduced the insect population in these locations.

DDT has also been widely used against garden and truck crop insects as well as against fruit and forest tree pests.

DDD or TDE

This material is a close relative of DDT which is commercially known as Rothane. It is rather similar to DDT in toxicity to insects although reputed to be less toxic to warm-blooded animals.

666 - Benzene hexachloride or 1, 2, 3, 4, 5, 6-hexachlorocyclohexane - $C_6H_6Cl_6$

This material was first prepared by Faraday in 1825. Slade (5) has given a very good account of this new mate-

rial. In 1943 scientists of the Imperial Chemical Industries found that it possessed insecticidal properties, particularly the gamma isomer which is present to the extent of about 12 per cent in the crude product.

It has been used in formulations similar to those for DDT and the gamma isomer is about 10 times as toxic to houseflies as DDT. It has been reported as very effective against human lice, bedbugs, fleas, cockroaches, crickets, wasps, and ticks.

As a residual spray, it is less persistent than DDT largely because of its greater volatility.

During the past summer, this material was tested in two forms in flour warehouses—as a smoke and in an oil spray. The latter gave results very similar to DDT while the smoke was not effective. The crude benzene hexachloride has a persistent and penetrating musty odour and some flour was contaminated by the smoke tests. Improvements in refining are reducing this objection.

Chlordane (1068 - Octa-Klor)

This material was described by Kearns et al (2) as a chlorinated hydrocarbon with the empirical formula $C_{10}H_6Cl_8$. It may be formulated for insecticidal purposes as a powder, oil solution, or emulsion. In volatility and residual effect against insects it has been found to be intermediate between DDT and gamma-benzene hexachloride. A two per cent solution in deodorized kerosene is very effective against the German cockroach. This material apparently exerts a fumigant action as well as killing by contact, as flies and other insects confined in cages in rooms previously sprayed with 1068 have been killed without actually coming in contact with the treated surfaces. Because of the higher toxicity of this material, it is less toxic to warm-blooded animals at effective dosages than DDT. It is quite compatible with DDT. It does not repel or excite insects to the same extent as DDT—an important consideration in practical work.

3956 - Toxaphene

This is a chlorinated bicyclic terpene (or camphene) with the empirical formula $C_{10}H_{10}Cl_8$. In the tests reported by Parker and Beacher (3) it appears to be somewhat less toxic than DDT in some cases and slightly superior in others. Preliminary tests of the toxicity to warm-blooded animals indicates a toxicity somewhat greater than DDT.

Piperonyl Butoxide

In combination with pyrethrum this new insecticide shows great promise in the control of insect pests in food processing plants, food establishments, and in the home. It possesses distinct residual properties and may be applied freely around foods because of its freedom from hazards to warm-blooded animals.

Piperonyl butoxide and pyrethrum have been used in a variety of formulations—as residual sprays, in oil, water suspension, and emulsion, as space sprays and in aerosol form, as well as in dusts. It has yielded satisfactory control of a variety of pests, including cockroaches, ants, mites, and a variety of stored product pests. It is now being tested as a proofing agent for food containers and shows distinct merit in this respect.

Spraying Equipment

During and since the war, there has been considerable progress made in spraying equipment for the application of insecticides in the household and stored product field.

The Lofstrand sprayer is an outstanding example of this progress. It was developed in cooperation with the United States Army to turn out a sprayer designed to apply DDT and other residual sprays in barracks and elsewhere, and at the same time stand the rigorous treatment accorded it by the Armed Services. This sprayer is very rugged, gives long hours of trouble-free service and is outstanding as an insecticide applicator.

The Torpedo sprayer is another addition to the field of applicators. It is designed to apply fine mist-like fogs of

the aerosol type. It contains two small tanks in the interior of the sprayer, one for water and the other, insecticide. The water is heated by an electric element to produce steam which acts as the propellent for the insecticide. Suitable sprays applied at rates as low as 1/4 oz. per 1,000 cubic feet have given control of cockroaches and various flying insects. The equipment is quite versatile and may be used for the application of various formulations in the control of greenhouse and other pests.

Inert Dusts

Aluminum oxide; Magnesium oxide; Silica Gel

These materials may be considered together. The killing is caused through physical rather than chemical action. When these substances in a finely divided state come in contact with the body of an insect, abrasions are made on the body covering. As a result, the water loss from the body of the insect is greatly increased and the insect dies in a few days. Where bulk material is to be protected, the chemical is mixed with grain or seed at the rate of about 0.1 per cent by weight. For use in warehouses about 1/2 to 3/4 of a pound of dust will treat the average flour warehouse holding a carload or more of stock.

Rodenticides

Research workers in the United States have recently developed two new rodenticides of great merit—Alpha-naphthyl-thiourea ('Antu') and sodium fluoroacetate ('1080'). Antu first appeared on the Canadian market in 1946 and is becoming increasingly popular. Because of the extremely high toxicity of 1080 to man and domestic animals, it has not been allowed entry as yet.

Alpha-naphthyl-thiourea (Antu)

While very toxic to the Norway or brown rat, this material is much less so to other animals. In conducting taste tests with various chemicals, Richter (4) discovered that this substance was an efficient rat poison.

Antu is a greyish powder, insoluble in water, stable, and non-volatile, and non-irritating to the human skin. It is at least five times as toxic as thallium sulphate, one of the best of the pre-war rat poisons. Three or four milligrams is enough to kill an adult brown rat. Animals which ingest a fatal dose die from acute pulmonary edema and pleural effusion, usually in from 12 to 48 hours. Rats which receive less than a lethal dose acquire a tolerance which may last for a month or more. Young rats are more resistant to the poison than the adults.

Antu may be used in a number of ways. As a dust or tracking powder, it is diluted with flour or pyrophyllite and dusted in rat holes, along rat runways, and on and around preferred foods. Baiting is also advisable. Two or three percent by weight of Antu should be thoroughly mixed with attractive food materials. Lower dosages often result in sub-lethal amounts being ingested while higher ones may repel the animals. Water suspensions of 1 to 2 percent of Antu exposed in small containers where the rats can drink it, are also effective.

Sodium fluoroacetate (1080)

The United States Fish and Wild Life Service developed 1080 as a substitute for thallium sulphate during the War. It is a fluffy white powder, odourless and almost tasteless and very soluble in water. While very toxic to rats, it is even more toxic to dogs and cats and other warm-blooded animals. It is estimated that less than one-fiftieth of an ounce would be fatal to man.

Sodium fluoroacetate may be used against rats by dissolving 1/2 ounce in 128 ounces of water and exposing in small containers. The rodents appear to prefer the solution in plain water. When used in bait form, 1 ounce is thoroughly mixed with 28 pounds of preferred food.

In the United States the sale and use of 1080 is carefully controlled and supervised and is limited to public health authorities and pest control operators.

Great care must be taken to safeguard humans and domestic animals where 1080 is used. In Canada its use is not as yet permitted. Its extreme toxicity, ready solubility in water, and the difficulty of detecting it by taste or smell, render it extremely dangerous. Furthermore, there is no known antidote.

It is believed that the action on the heart is the primary cause of death in warm-blooded animals. Frick and Boebel (1) found that the only postmortem symptom in horses given lethal doses was the condition of the blood, which was black, thick, and tarry. Muscle, liver, and heart tissue from these animals were fed to dogs and the dog eating the heart tissue died and its blood exhibited symptoms similar to the horses.

Insect and rodent control in food establishments is a professional problem. In a few cases an intelligent owner and an equally intelligent staff may be able to control these pests satisfactorily. In general, far greater success will attend the efforts if a good pest control operator is employed. When the premises are to be remodelled, a contractor and a skilled staff of carpenters and other workmen are called in. It is equally important, where the problem involves specialized knowledge as to the methods to be employed and the safeguards to be observed, that a trained man should do the work of extermination. Pest control operators are licensed by the Provincial Department of Health only after passing examinations indicating that they are properly qualified to carry out such work. They also require that they establish financial responsibility by posting a suitable bond.

If modern methods are intelligently applied by such an operator, there is no reason why the insect and rodent population in each food establishment should not be reduced to a minimum. Serious and long-standing infestations have been eliminated.

As sanitary inspectors you are certain to encounter pest problems in connection with your work. Any assistance you can render to the food industries would seem to be a logical extension of the very worth-while program of the inspection service.

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NEWS

THE Canadian Public Health Association records with deep regret the passing of two members who made important contributions to public health in Canada and who had also taken an active part in the work of the Association. In September the deaths occurred of the Honourable Edward William Montgomery, M.D., in Winnipeg, and Dr. R. St. John Macdonald in Montreal.

Dr. Montgomery was born in St. Sylvestre, Quebec, in 1885, and was a graduate in arts and medicine of the University of Manitoba. He was the first professor of medicine in the reorganized faculty of medicine of the University, and held this position until 1927, when he was elected to the Legislature and became the first Minister of Health and Public Welfare. Though he had a large and important private practice, his primary interest was public health. As Minister of Health, he forwarded the program of immunization of school children and was deeply concerned with the problem of maternal mortality. The first health unit in the province was established in his administration. A diagnostic tuberculosis clinic was opened in Winnipeg, a tuberculosis sanatorium erected in St. Vital, a cancer relief and research institute set up, and modern buildings provided for the Brandon and Selkirk mental hospitals. Following his retirement from public life in 1932, he became chairman of the Board of Health, an appointment which he held until his death. In 1928 he was honorary president of the Canadian Public Health Association and his counsel was of great assistance in the development of the Association's program at that time.

Dr. Macdonald was a native of Nova Scotia and a graduate of St. Francis Xavier College, Antigonish, and of McGill University. He was a life-long student of public health, particularly of sanitation, housing and allied subjects. He received his Diploma in Public Health from McGill University in 1912 and commenced teaching in the department of public health and preventive medicine. In 1943 he succeeded the late Dr. Grant Fleming as director of the department, from which position he retired in 1946. During the first world war, Dr. Macdonald served as officer commanding, no. 9 stationary hospital, C.A.M.C. He was chairman of the Canadian Public Health Association's Committee on Housing for many years, and prepared a set of model provincial housing regulations which had a wide distribution.

British Columbia

DR. J. A. TAYLOR, D.P.H., was appointed director of the division of health units last March. Prior to this appointment, Dr. Taylor was director of the Central Vancouver Island Health Unit, which position is now assumed by Dr. A. N. Beattie, D.P.H., formerly director of the South Okanagan Health Unit.

DR. J. S. CULL, D.P.H., formerly deputy provincial health officer, has resigned to accept a position with the Canadian Red Cross Society as provincial director of the blood transfusion service.

DR. GEORGE ELLIOT, D.P.H., director of the division of venereal disease control, has been appointed assistant provincial health officer in charge of the Vancouver area, and head of the provincial committee of health studies.

SEVERAL APPOINTMENTS to health units have been announced recently. Dr. Helen Zeman, D.P.H., who had been assisting in the Central Vancouver Island Health Unit, is now director of the South Okanagan Health Unit. Dr. Elizabeth MacKay, D.P.H., is director of the Saanich and South Vancouver Island Health Unit. Dr. T. H. Patterson, D.P.H., has taken charge of the newly formed Cariboo Health Unit.

MISS MONICA FRITH, formerly assistant director, has been appointed director of public health nursing. She has replaced Mrs. Warren Slaughter, who resigned to join her husband in Saudi, Arabia.

Alberta

DR. G. M. LITTLE, D.P.H., medical officer of health, Edmonton, was elected president of the Alberta Public Health Association at the annual meeting of the Association held in Banff on September 7th and 8th.

DR. J. A. GILLET, D.T.M., M.P.H., has been appointed director of the division of communicable diseases and director of district health units. He was formerly with H.M. Colonial Medical Service, in the West In di and South Africa. es

THE WORK OF THE ALBERTA HEALTH SURVEY commenced on September 1st. The survey committee is composed of Dr. A. Somerville, D.P.H., assistant deputy minister of health, who has been named director; Miss J. S. Clark, director of public health nursing; Mr. John McGilp, assistant director, division of hospital and medical services; Mrs. Winnifred Ross of Millet, representing women's organizations; Mr. A. A. Dunkley, mayor of Olds, representing the Urban Municipalities Association; Mr. A. B. Harstad of Bentley, representing the Alberta Association of Municipal Districts; Mr. L. Adshead, of the University of Alberta Hospital, Edmonton, representing the Associated Hospitals of Alberta; and Dr. A. E. Archer, Lamont, representing the College of Physicians and Surgeons.

MISS A. M. EVANS, formerly assistant director, has been appointed acting director of public health nursing, replacing Miss J. S. Clark who has been granted leave of absence to enable her to serve on the Alberta health survey committee. Miss Blanche A. Emerson has become acting assistant director of the division.

THE STAFF OF THE STETTLER HEALTH UNIT is once again up to strength with the appointment of Dr. C. A. More as medical officer of health.

DR. G. N. BALL has been appointed medical officer of health of the Foothills Health Unit.

A NEW HEALTH UNIT has been established which will make full-time public health services available to the city of Drumheller and the adjoining district. It is expected that the unit will be functioning shortly.

Saskatchewan

THE PROVINCIAL HOSPITAL TAX has been raised from $5 to $10 per caput for single persons and members of small families, according to an announcement by Premier T. C. Douglas. The maximum payment by a family is unchanged and remains at $30 a year.

DR. JOHN ORR, medical superintendent of Fort Qu'Appelle Sanatorium, has been appointed medical director and general superintendent of the Saskatchewan Anti-Tuberculosis League, succeeding Dr. R. G. Ferguson, O.B.E., who has retired.

Manitoba

DR. J. C. COLBECK, B.S., M.R.C.S., L.R.C.P., has been appointed director of laboratory services for the provincial Department of Health and Public Welfare. He succeeds Dr. F. Cadham, who resigned early in the year. Dr. Colbeck served as director of the emergency public health laboratory for Kent and the corresponding centre of Greater London from the outbreak of the war until 1943. He then was appointed director of pathology in Warwickshire, and three years later became director of laboratory services for the West Riding of Yorkshire.

MISS MARIE ALFORD, formerly junior nutritionist with the provincial division of health education, has been granted leave of absence to attend the University of North Carolina, where she is doing postgraduate work in health education.

Ontario

ON NOVEMBER 4th, 5th and 6th, the fifty-fifth meeting of the Dominion Council of Health was convened in Ottawa, in the offices of the Department of National Health and Welfare. Primary consideration was given to matters relating to the federal grants in public health. Miss Elizabeth L. Smellie, C.B.E., LL.D., who had recently been appointed a member of the council, was welcomed. Miss Smellie served as chief superintendent of the Victorian Order of Nurses for Canada from 1924 to 1947, except for four years' service during World War II as matron in chief (Canada) of the Royal Canadian Army Medical Corps' nursing service, from which she retired with the rank of colonel. The Honourable Paul Martin expressed the council's appreciation of the services rendered over a period of years by Mrs. H. D. Smith of New Westminster, B.C. Mrs. Smith, who is a member of the Provincial Legislature, is known for her work in welfare and health.

DR. G. Q. SUTHERLAND, D.P.H., has been appointed chief medical officer of the Wellington County Health Unit.

DR. T. A. LOMER, who has been medical officer of health for the city of Ottawa for many years, has retired. He has been succeeded by Dr. John Jessup Day, formerly medical officer of health for Westmount, Quebec. Dr. Day was born at Lachine, Quebec, in 1905. He received his B.A. degree from McGill in 1927 and graduated in medicine in 1931, later obtaining the Diploma in Public Health. He was in general practice from 1937 to 1940 and served as physician in

charge of medical services at the Verdun plant of Defence Industries Limited, from 1941 to 1944. In January 1945 he was appointed medical officer of health for Westmount.

ON THE RECOMMENDATION of the Honourable Russell T. Kelley, Minister of Health, a committee to be known as the Ontario health survey committee has been appointed to make a survey of existing health, hospital and related facilities. The chairman is Mr. G. D. Davis, Toronto, and the other members are: Mr. Alec. McKinney, Brampton; Mr. D. E. Catto, Toronto; Mr. A. B. Meiklejohn, Toronto; Mr. C. J. Telder, Toronto; Dr. A. H. Sellers, Toronto; and Dr. K. G. Gray, Toronto. Dr. Leonard O. Bradley, professor of hospital administration in the School of Hygiene, University of Toronto, has been granted leave of absence (part time) to serve as director of studies for the survey. The committee is empowered to appoint an advisory committee.

Quebec

THE FOLLOWING PHYSICIANS are registered in the course for the Diploma in Public Health at the School of Hygiene, University of Montreal: Dr. C. E. Germain, l'Epiphanie; Dr. Alfred Langlois, Ville-Marie; Dr. J. A. LeBlanc, Amos; Dr. A. Quimper, Rimouski; and Dr. J. H. Rabb, Fort Coulonge.

THE COUNTY HEALTH UNIT of Temiscouata-Rivière du Loup, which was established in 1928, has been divided into two units. Dr. Sarto Sirois will remain in charge of the Rivière du Loup unit. Dr. Leonce Gaudreault has been appointed medical officer of health of the Temiscouata unit.

FOUR ASSISTANT MEDICAL HEALTH OFFICERS have been appointed recently to the following county health units: Dr. P. Riopelle in Hull; Dr. R. Desjardins in Terrebonne; Dr. Marguerite Dorion in Loretteville, County of Quebec; and Dr. Francoise Lessard in Levis.

DR. JEAN PHANEUF is taking charge of the county health unit of Wolfe, which has headquarters in Weedon.

DR. PAUL CLAVEAU, who has returned from a year of postgraduate study in Paris, has succeeded Dr. Alexandre Beaudet as medical health officer of the Labelle county health unit. Dr. Beaudet has accepted an appointment with the Grand'mère health unit. He succeeds Dr. E. Frenette, who is now serving in Verchères.

DR. J. H. MAYNARD, formerly medical health officer for Hull, has been appointed regional medical officer of health. He has been succeeded by Dr. Octave Roy of Verchères.

THE MEDICAL STAFF of the Department of Health attended a conference at the School of Hygiene, University of Montreal, on November 8, 9 and 10. The subject of study was vaccination by B.C.G.

DR. O. R. A. LEROUX, regional medical superintendent of Indian health services for Quebec, has been promoted to the post of assistant director.

New Brunswick

THE PROVINCIAL DEPAPTMENT OF HEALTH has announced the establishment of a division of dental health with Dr. Robert Langstroff as director. At present Dr. Langstroff is enrolled in the course leading to the Diploma in Dental Public Health at the School of Hygiene, University of Toronto.

Nova Scotia

DR. C. W. BLISS has resigned as medical health officer of Amherst after acting in this capacity for more than forty years.